

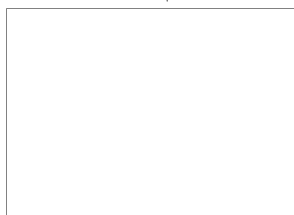
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NATIONAL PHOTOGRAPHIC  
INTERPRETATION CENTER

**PHOTOGRAPHIC  
INTERPRETATION  
REPORT**

**MESSOYAKHA-NORILSK GAS PIPELINE  
USSR**



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## MESSOYAKHA - NORILSK GAS PIPELINE, USSR

1. The Messoyakha - Norilsk gas pipeline, the northernmost pipeline in the world, was constructed to transport natural gas from the Messoyakha gas field to the important industrial city of Norilsk, USSR (Figure 1). This report locates and describes the Messoyakha gas field and discusses the construction methods used in laying the Messoyakha - Norilsk pipeline.

2. Construction of the Messoyakha - Norilsk pipeline<sup>1</sup> was completed in December 1969. Although relatively short in length -- approximately 150 nautical miles (nm) -- this pipeline is of special interest because it lies entirely north of the Arctic Circle in a permafrost area and is laid above-ground, supported by piles, except at the major river crossings. The construction of an oil pipeline in northern Alaska will probably encounter similar climatic conditions and require construction techniques similar to those used in the construction of the Messoyakha - Norilsk pipeline.

3. The pipeline will transport natural gas to Norilsk, the site of the Norilsk Metallurgical Combine, the major producer of nickel in the Soviet Union and a large producer of copper. The introduction of natural gas to Norilsk will probably result in the Soviets' supplementing, and perhaps eventually replacing, coal as the energy source for the development of ore resources and the production of metals. Natural gas can also be expected to improve the daily living of inhabitants of Norilsk and its environs, which in turn could contribute to the retention of the labor force in this polar region.

The Messoyakha Gas Field

4. Discovered in 1967, the Messoyakha gas field is near the Messoyakha River at 69-05N 082-55E, roughly in the center of the Gydan'skiy Peninsula, a large drainage area bounded by the Yenisey River to the east and the Ob River to the west. The field was first observed on KEYHOLE photography of March 1970 (Figure 2). This small-scale photography provided coverage of the gas field, the settlement of Messoyakha, and approximately 50 nm of the pipeline. From this photography, six gas wells, four with derricks erected, were identified. The six wells appeared to be connected to a probable gas treatment plant, which also serves as the head of the pipeline.

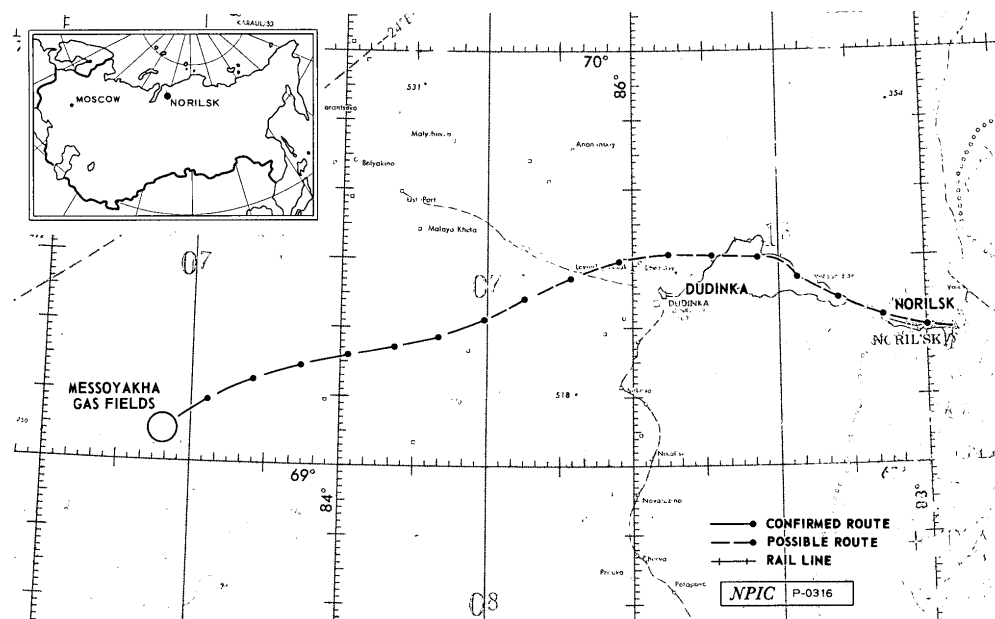


FIGURE 1. ROUTE OF MESSOYAKHA - NORILSK GAS PIPELINE, USSR

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5. The settlement of Messoyakha consists of approximately 20 buildings, including workers quarters, storage buildings, a powerplant, and a possible compressor station. An all-weather road provides access to all the wells and the treatment plant and roughly parallels the pipeline to the east.

#### Pipeline Route

6. The pipeline passes through the Taymyr National District and the Krasnoyarsk region between the 69th and 70th parallels, north of the Arctic Circle. The route is divided into two sections by the Yenisey River. The first section, west of the Yenisey, from the gas field to Dudinka, passes through a lowland with numerous rivers, lakes, and marshes. The second section, east of the Yenisey, from Dudinka to Norilsk, is a plain with low hills and numerous lakes and depressions. The route from Dudinka to Norilsk is not known, but it may be assumed that it follows the Dudinka - Norilsk rail line, which offers the fewest obstacles and provides the most direct route.

7. Small-scale photography of areas west of the Yenisey revealed that the pipeline does not follow a straight line; rather it follows a partly sinuous, partly zigzag course in order to compensate for the expansion and contraction resulting from severe temperature changes.

#### Pipeline Construction

8. According to Soviet reports as quoted in Oil and Gas Journal,<sup>2</sup> 1 July 1968, construction on the pipeline began in July 1968, and the first shipment of pipe arrived at that time at the port of Dudinka on the Yenisey River.

9. [ ] provided large-scale photography of the Dudinka area. This photography revealed two barges loaded with pipe moored in the Yenisey River at Dudinka and barges offloading pipe at the wharf. Stacks of pipe were observed at the wharfside and trucks with tandem trailers were parked nearby to transport the pipe to a welding area on the outskirts of town. This welding area provided facilities for welding three lengths of pipe together (Figure 3). A helicopter pad observed adjacent to the welding facility suggests that some of the pipe may have been delivered to the laying-in sites by helicopter, as reported in the Soviet press.

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10. The pipe rests on supports approximately 32 to 35 meters (104 to 114 feet) apart. According to the Soviet press, these supports consist of piles driven into the permafrost. The piles on which the pipe rests are probably H or X shaped. Where small shallow lakes and streams had to be crossed, the line is also supported on piles. The crossing of larger rivers, such as the Malaya Kheta and the Bolshaya Kheta, posed greater problems. These rivers were reportedly crossed by laying the pipe across the frozen river and blasting holes to break the ice, allowing the pipe to settle to the bottom.<sup>3</sup>

11. According to Soviet press reports, the pipeline crosses the Yenisey a few miles downstream from the port of Dudinka. It is likely that the method used for crossing the Bolshaya Kheta and the Malaya Kheta was also used in crossing the Yenisey.

## REFERENCES

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## DOCUMENT

1. CIA. Translation of article from Sotsialisticheskaya Industriya, 28 Dec 69 (UNCLASSIFIED)
2. Oil and Gas Journal, 1 Jul 68 (UNCLASSIFIED)

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## REQUIREMENT

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